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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/811,360

03/26/2004

James D. Beasom

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08/25/2004

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EXAMINER

LUU, CHUONG A

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,360

Applicant(s)

BEASOM, JAMES D.

Examiner

Chuong A Luu

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-37 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 38-53 and 55 is/are rejected.
- 7) ☒ Claim(s) 5 and 54 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/26/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

PRIOR ART REJECTIONS

Statutory Basis

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The Rejections

Claims 1-4, 6-9, 38-41, 44-53 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hshieh (U.S. 6,172,398 B1) in view of Muller et al. (Device Electronics For Integrated Circuits).

Hshieh discloses the following:

A body region 130 in a substrate 105;

A source 140 in the body region 130;

Hshieh additionally discloses that the substrate and body layer are N⁺ and p type, respectively (see column 2, lines 49-66; column 3, lines 56-66; column 4, lines 8-34. Figures 3A, 5A-5F).

The only feature not clearly taught in Hshieh is the narrow band gap material which has a band gap narrower than a band gap of the substrate material. However, the reference does state that the substrate and the body are formed in a conventional ion implantation manner. The examiner takes Official Notice that such a band gap is well

known in the art. In support of this assertion the examiner has cited Device Electronics For Integrated Circuits by Muller et al. This textbook discloses the band gap varies due to the impurities ions implantation formation. Consequently as this is a conventional method of formation of MOS well known to one of ordinary skill in the art at the time of applicant's invention, it would have been obvious to one of ordinary skill in the art to clarify the manner of formation of the MOS with a narrow band gap material which has a band gap narrower than a band gap of the substrate material of Hshieh by using the teaching of Muller.

For Muller see pages 54-56.

Claims 7, 9-10 and 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hshieh (U.S. 6,172,398 B1) and Muller et al. (Device Electronics For Integrated Circuits) and further in view of Agnello et al. (U.S. 6,406,962 B1).

Hshieh and Muller teach everything above except for disclosing specifically material of the narrow band gap material; tilt angle implantation; germanium ions dopant. Further, Agnello as showing that in order to create an adequate contact to the source by tilt angle implantation with germanium ion that would convert the silicon substrate to GeSi material. Therefore, it would have been obvious to one of ordinary skill in the art to read the teaching of Agnello and make the device formed by the combination of Hshieh and Muller have the semiconductor structure to exceed its performance criteria.

For Agnello see column 3, lines 42-50; column 13, lines 1-15.

Allowable Subject Matter

Claims 5 and 54 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Claims 11-37 are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A Luu whose telephone number is (571) 272-1902. The examiner can normally be reached on M-F (6:30-3:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


CARIDAD EVERHART
PRIMARY EXAMINER

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August 9, 2004